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## PERCEPTION OF SLIGHT COLOR DIFFERENCES

Cottonseed and other vegetable oils are graded by color, and the color is an important item in determining the price which the oil commands on the market. The Bureau of Standards is cooperating with the American Oil Chemists' Society in establishing color standards for this purpose.

However, the reliability of the color grading is not assured merely by providing correct standards. The color sense of the person who does the color grading must be considered, especially his ability to perceive small differences in hue for yellows.

At the request of the American Oil Chemists' Society, Irwin G. Priest, of the bureau, has conducted tests of the color sense of about 30 of the society's mem-

bers; and the results were published in the January number of its official organ, Oil and Fat Industries.

This test was especially designed to measure the observer's ability to perceive small differences at the color which is standard for prime yellow oil. The method of test was that of "right and wrong answers," the observer reporting color differences as they appeared to him while the conductor of the experiment kept a tally of correct and incorrect answers. A score of 9 or 10 correct answers in 10 trials indicates that the observer is able to detect the difference with practical certainty.

The results of these tests, which are regarded as preliminary rather than final, indicate that many of the chemists (perhaps one-third or even two-thirds) are unable to discern with certainty the

smallest differences which are considered in color grading the oil in present trade practice. It should be noted, however, that these differences are so small that only exceptional observers can be expected to be certain about them. One or two were found to be quite incompetent to do color grading, being very uncertain about differences which are unmistakable to competent normal observers. At least four fell below what might reasonably be accepted as a normal ability to perceive hue differences.

Incidentally, these tests have shown that the normal observer's sensibility to difference in wave length is much greater than has been believed heretofore. Good observers can detect with certainty a difference of wave length as small as  $1/10,000,000$  of a millimeter for yellow light. This is of the order of one-fifth or one-tenth of what has been given as the "least perceptible difference" by previous authorities. This aspect of these data has been discussed in a paper communicated to the Optical Society of America at its meeting in Schenectady, October, 1927, and will appear in abstract in the February number of the Journal of the Optical Society.

#### STATISTICAL STUDY OF WATCH-MAKERS

A detailed study of nearly 1,000 watchmakers who have applied for examination in the Horological Institute of America has been completed by the time section of the Bureau of Standards. The survey is probably a fair cross section of the watchmakers' trade as it is to-day. The ages range from 16 to 73 years, with an average of about 35 years. The watchmakers may be divided into three groups: (1) Those in business for themselves, (2) those working for others, and (3) those attending horological schools. The last group is fairly numerous in the ages below 35, but by far the largest number are employed by others. Those working for themselves comprise about one-sixth of the total number.

The results show that a large majority of the men are capable of performing

good work. A few have dropped out through failure to pass the examination, while others have tried a second time and succeeded in passing on the second trial. Of the 786 who have already been granted junior watchmaker's certificates, 373 have applied for the higher grade examination, and 301 have completed this grade. On the average, it is found that 4 to 5 months are required for the completion of the junior examination and 5 to 6 months for the certified examination. Many other interesting statistics are shown by this survey, and the list might well be of use in case of national emergency, as the watchmakers furnish a great many of the skilled instrument makers. It is planned to keep this list as current as possible and to make a further study.

#### SCHOPPER PAPER-FOLDING TESTER

Paper in use is subjected to a variety of types of wear involving bending, creasing, and folding. The Schopper folding tester is designed to test the probable resistance which paper offers to such wear. This tester has many working parts, the condition and adjustment of which affect more or less the folding results. The errors arising from maladjustment or friction in these parts amount to the same thing as errors in adjusting the tension applied to the specimen during the test. It is therefore necessary to calibrate the tester frequently and to make such adjustment as may be necessary in the spring tension. The older method of doing this is troublesome and requires taking the instrument apart. As a consequence the calibration of these folding testers is often neglected. A new device is described in the bureau's Technologic Paper No. 357, Calibration and Adjustment of the Schopper Folding Tester, by F. T. Carson and L. W. Snyder. This device does not require the removal of any part from the tester and makes possible an accurate adjustment of the spring tension in a very short time and with little trouble. It consists of a balanced bell-crank lever supported at the end of a bracket which

is fastened to the tester. By using this apparatus the tester is calibrated by means of dead weight applied to the springs. The publication also contains a discussion of the effect of the mechanical variables of the instruments and means of minimizing errors in test results that may arise from these variables. Copies of this paper may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents each.

#### REPORT OF COMMISSION ON RADIO WAVE PROPAGATION

The large amount of work being done in what may be called the physics of radio transmission is described in the report of the Commission on Radio Wave Propagation of the International Union of Scientific Radio Telegraphy presented at the recent meeting in Washington by the chairman of the commission, Dr. L. W. Austin, of the Bureau of Standards. Among the facts of general interest mentioned in this report are the following: It is found that in England in summer the reflection from the Kennelly-Heaviside layer is so strong even in the daytime that the signals from a French trans-Atlantic station near Paris alternately increase and decrease in strength as the distance to the receiving station is increased. This seems to be the result of interference by ground and reflected waves. Thus, the signals at Aberdeen, 621 miles away, are about three times as strong as at Manchester, 373 miles distant. It is also found that the variability from day to day in long-wave daylight signals (above 10,000 m) is generally nearly independent of the distance, beyond 155 miles. The French committee reported that in tropical Africa, contrary to the experiments in most parts of the world, they find no skip distance in the ultra high-frequency waves; that is, no range of distance over which no signals are heard, while they are strong at both shorter and longer distances. The English committee finds in regard to the apparent night direction variations of sending stations that they

are independent of wave length above 300 m and that the errors in apparent direction reach a maximum at about 150 miles over land and at about 450 miles over sea and that they are slight for distances beyond 3,000 miles. In America, more evidence is constantly being found for a relationship between solar activity (sun spots) and signal strength.

#### SPECIFICATIONS FOR AUTOMOTIVE AND RADIO STORAGE BATTERIES

The proposed master specifications for automotive and radio storage batteries which were prepared by a technical committee of the Federal Specifications Board were discussed at a conference of storage-battery manufacturers held at the Bureau of Standards on December 19. The automotive specifications are essentially a revision of similar specifications prepared six years ago, which have been subsequently used by the Motor Transport Division of the War Department. The principles were discussed by the conference, but as the time was insufficient to reach agreement on all of the technical details, a committee was provided for to continue the work. This committee, which has not yet been appointed, is to consist of representatives from the Society of Automotive Engineers, the National Electrical Manufacturers Assn., the Bureau of Standards, and two battery manufacturers at large. It is expected that this committee will be appointed and begin its work shortly after the beginning of the new year.

The proposed specifications were sent to a large number of battery manufacturers and organizations interested in the preparation of these specifications. Those in attendance included representatives of the National Electrical Manufacturing Assn., the Electric Storage Battery Co., the Philadelphia Storage Battery Co., Carlile & Doughty, Prestolite Storage Battery Corporation, U. S. L. Battery Corporation, Willard Storage Battery Co., and Westinghouse Union Battery Co. In addition to these manufacturers, representatives of Government departments were present from the Bureau of

Standards, the National Committee on Wood Utilization, the engineering section of the Motor Transport Division of the Quartermaster Corps, and the Signal Corps of the War Department, Bureau of Engineering, Navy Department, and the Department of Agriculture.

#### CLEANING OF FUR AND LEATHER GARMENTS

The increasing use of fur and leather garments and trimmings has made the necessity for adequate methods for cleaning more urgent. Dry-cleaning plants have been handling a large proportion of these materials, either directly or on a wholesale basis, for furriers and cold-storage establishments.

An investigation of cleaning processes was made by the bureau to establish a method which would thoroughly clean the fur and leather garments and yet retain the "fat-liquor" content which is essential to the appearance and pliability of the material.

It was found that by modifying the usual dry-cleaning process by the addition of small percentages of paraffin this result could be accomplished. Samples cleaned in the laboratory showed no loss of color, had a good appearance, and retained their pliability.

Trials in cleaning plants of preliminary recommendations permitted the fixing of standard practices.

#### THERMAL EXPANSION OF FELDSPAR

Technical News Bulletins No. 117 (January, 1927), No. 121 (May, 1927), and No. 123 (July, 1927) summarized the work to date in the investigation of the effect of feldspar in white-ware bodies. This report is a summary of the study of the thermal expansion, by the interferometer method, of partially and completely fused feldspars fired to cones 4, 8, 10, 12, 13, and 14. There are 19 feldspars included in the investigation ranging in composition from No. 1, which is almost pure albite, a high  $\text{Na}_2\text{O}$  content feldspar, to No. 19, which is a practically pure specimen of orthoclase, a high  $\text{K}_2\text{O}$  content feldspar. The data obtained show:

1. The expansion of all the feldspars fired to the above temperatures proceeds quite regularly until a temperature of  $575^\circ\text{C}$ . ( $1,067^\circ\text{F}$ .) is reached, when the rate of expansion increases decidedly because of a property characteristic of quartz which at this temperature changes suddenly from the  $\alpha$  form to  $\beta$  form of crystallization. This expansion of flint is not to be confused with the regular heat expansion of the feldspar, but is an additional change which is peculiar to the flint. Since this extra expansion is not part of the expansion of the flint-free spar, the true percentage of linear expansion at  $560^\circ\text{C}$ . is reported.

2. The thermal expansion of a feldspar fired below cone 8 is low, becomes normal at cone 8, and drops again when the firing temperature rises above cone 8. Obviously this will depend upon the amount of flint in the feldspar. The low expansion of the underfired feldspar results from the fact that there is so much pore space in proportion to the solid mass and that the flint is still present in the unaltered state. The low expansion of the overfired feldspar is due to the fact that the flint has been dissolved by the fused feldspar. Silica has a very high expansion as long as it remains quartz, but has a low expansion when it has been dissolved to a glass by feldspar.

3. The highest expansions noted for feldspars fired to cone 8 are for spars 6 and 7 (relatively low  $\text{K}_2\text{O}$  content feldspars), and are the result of their high silica content. The lowest expansion noted for feldspars fired to cone 8 is for spar No. 1, which is an almost pure albite ( $\text{Na}_2\text{O}$  feldspar). For cone 10 the highest expansion is seen with spars 6 and 7, due again to their high silica content, while the lowest expansion is found with spar No. 19, a high  $\text{K}_2\text{O}$  content spar.

Therefore, it seems logical to conclude that the silica content has more influence upon the expansion of partially and completely fused feldspars than the  $\text{Na}_2\text{O}$  or  $\text{K}_2\text{O}$  content, or the fineness of the grind.

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The following table shows the percentage of linear expansion of the partially and completely fused feldspars at 560° C., together with their softening points and the percentages of free silica content.

Spar No.	Cone						Softening point of cone	Free SiO <sub>2</sub>
	4	8	10	12	13	14		
1.....	0.284	0.402	0.406	.....	.....	.....	4	P.ct. 2.8
2.....	.328	.487	.468	.....	.....	.....	5	21.8
3.....	.286	.438	.437	.....	.....	.....	4	11.4
4.....	.....	.484	.462	.....	0.418	.....	6	20.4
5.....	.....	.482	.460	.....	.394	.....	5	21.2
6.....	.....	.522	.503	.....	.464	.....	7HD	20.0
7.....	.....	.542	.504	.....	.476	.....	7	25.1
8.....	.....	.475	.446	.....	.444	.....	6HD	11.3
9.....	.....	.480	.480	.....	.483	.....	7	17.6
10.....	.....	.460	.450	.....	.443	.....	7HD	10.6
11.....	.....	.476	.466	.....	.452	.....	7HD	12.4
12.....	.....	.469	.470	.....	.437	.....	7	12.5
13.....	.....	.450	.448	0.434	.....	0.406	8	12.0
14.....	.....	.438	.466	.470	.....	.430	8HD	12.6
15.....	.....	.418	.452	.438	.....	.422	8	8.5
16.....	.....	.458	.473	.....	.420	.....	8	12.7
17.....	.....	.387	.404	.....	.401	.....	10HD	6.9
18.....	.....	.427	.413	.....	.406	.....	8	1.9
19.....	.....	.396	.421	.....	.450	.....	9	2.2

#### TESTS OF LARGE CONCRETE CYLINDERS

During the month of December the bureau tested a large group of concrete cylinders. The cylinders were made during the construction of the Santeetlah Dam, of the Tallassee Power Co., shipped, protected by moist cinders and burlap, by flat car to the bureau, and tested at the age of approximately three months. They were all in the proportion of height equal to twice the diameter, and had been accurately made to dimension. There were eight sizes of specimens, 2, 3, 6, 8, 12, 18, 24, and 36 inches in diameter. The largest cylinders weighed approximately 6,300 pounds, and were considerably larger than any heretofore tested.

The ends of the 2 and 3 inch cylinders were ground to a plane surface before testing. The 6, 8, and 12 inch cylinders were capped with plaster of Paris previous to being placed in the testing machine. The larger cylinders were capped in the testing machine. All aggregate was obtained from crushing the natural

rock. The larger pieces of the aggregate were bounded in general by two flat surfaces indicative of the lamellar nature of the rock. The pieces were not thin, the proportion of length to thickness being in the nature of one to six. The maximum size of the aggregate varied, running to a maximum of 10-inch material in some of the larger cylinders. The fine aggregate was obtained from the same rock, practically all passing the three-eighths inch sieve and having an approximate fineness modulus of 3.5.

Examination of the aggregate showed two types, one a laminated and fibrous rock, evidently a schist, containing biotite, muscovite, pyrite, a little quartz, and one unidentified mineral, possibly pyrophyllite, the other a gneiss composed of biotite, muscovite, quartz, plagioclase, feldspar, and one or two unidentified minerals present in small amounts.

One group of cylinders, including specimens of every size, was made in the proportion of 1 part cement to 2.7 parts of aggregate, all aggregate having been smaller than the three-eighths inch sieve. In this group the 36-inch cylinders developed an average compressive strength of 2,550, the 12, 18, and 24 inch specimens approximately 3,000, the 6 and 8 inch specimens 4,100, and the 2 and 3 inch specimens approximately 5,100 lbs./in.<sup>2</sup>

In the other groups of cylinders, the 36-inch cylinders contained aggregate of maximum size varying from 2½ to 10 inches, proportions being approximately 1:3:3, 1:3:4, and 1:3:4.6. Before filling the 8-inch molds, all aggregate above 2½ inches was removed from the concrete, for the 6-inch molds all above 1½ inches, and for the 2 and 3 inch molds all above three-eighths inch. The strength of the 36-inch diameter cylinders varied from 1,500 to 3,100 lbs./in.<sup>2</sup>, compared with the minimum and maximum average strengths of 2,260 and 4,400 for the 8-inch and 3,130 and 4,700 for the 6-inch cylinders. There was a general tendency for the smaller specimens to give higher strengths.

Stress-strain readings were taken on the 18 and 36 inch diameter cylinders,

readings being taken without stopping the application of load. The readings were continued until maximum load was reached. The ultimate strains varied from 0.0015 to 0.0032 inch per inch, and the initial modulus of elasticity varied from 2,200 to 3,600,000 lbs./in.<sup>2</sup> In all cases the average modulus for the 36-inch cylinders was higher than for the 18-inch cylinders.

#### POISSON'S RATIO AND THE MODULUS OF ELASTICITY OF SAND-LIME BRICK

Some recent work on sand-lime brick at the Bureau of Standards has consisted in testing this product for stress-strain relationships. The loads were applied by a 20,000-pound testing machine, while the strains were determined by the use of Tuckerman optical strain gauges. The latter gave most excellent results, and furnished a very accurate picture of what occurred when the loading was increased or diminished. Incidentally, the results speak well for the uniformity of these bricks.

Twelve bricks were tested. Four were tested in tension, four in compression on end, and four in compression edgewise. With the bricks tested on edge, the secant modulus of elasticity varied from an average value of about 1,700,000 lbs./in.<sup>2</sup> at no load to about 1,600,000 at a stress of 1,000 lbs./in.<sup>2</sup> For a second loading the modulus of elasticity was nearly constant throughout the loading and its average value was about 1,600,000 lbs./in.<sup>2</sup> The modulus of elasticity in compression was about equal to the modulus in tension.

For the modulus of elasticity determinations, readings of strain were obtained on two gauges attached at the center of the length on opposite sides of the brick. It was found that with a slightly eccentric loading in compression the readings for the two gauges were unequal, but the averages were approximately the same as for concentric loading.

Both the longitudinal strains (in the direction of the loading) and the transverse strains (at right angles with the

direction of the loading) were determined on one brick. From these strains the value of Poisson's ratio (the ratio of the transverse to the longitudinal strain) was found to be one-seventh throughout the range of the loading.

Three bricks were tested for changes in strain while being loaded transversely; that is, in bending. The supporting knife-edges were 7 inches apart and the load was applied on top at the center of the span. A notch was cut in the upper knife-edge so that it could straddle the gauge. To insure pressure directly under the gauge, as well as elsewhere, a steel strip extended across the brick under the gauge and under the knife-edge so that the load would be distributed properly. There was close agreement between the compression of the upper side and the elongation of the lower side, these relations holding also when the brick was turned over and tested again. This would indicate that the neutral axis lay in a plane half way between the upper and lower sides.

#### STATISTICS AND ECONOMICS OF BUILDING CONSTRUCTION

The total value of contracts awarded during the first 11 months of 1927 has declined 0.2 per cent as compared with the first 11 months of 1926, according to the F. W. Dodge Corporation. The total for that period, for 1927, in 36 Eastern States was \$5,619,783,000, while for the corresponding period in 1926 it was \$5,631,886,000. Construction of industrial buildings shows the greatest decline compared with 1926, and residential building is down about 4 per cent. These decreases have been practically offset by larger contracts for public works, public utilities, and public buildings. The wholesale building material price index has shown a gradual decline during the year, and is now lower than for any time in several years.

#### CITY PLANNING AND ZONING

The subject of zoning continues to be one of interest throughout the country. "Zoning Progress in the United States," which was issued early in October, 1927,

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is being called for daily, and over 3,000 copies have been mailed out since it was prepared. This report showed that up to July 1, 1927, 553 municipalities had adopted zoning regulations. Since the report was issued 25 additional cities have been reported.

At a special election on Tuesday, September 20, 1927, the following amendment to the constitution of the State of New Jersey was adopted and becomes Article IV, paragraph 5, of section 6 of the constitution:

The legislature may enact general laws under which municipalities, other than counties, may adopt zoning ordinances limiting and restricting to specified districts and regulating therein, buildings and structures, according to their construction, and the nature and extent of their use, and the exercise of such authority shall be deemed to be within the police power of the State. Such laws shall be subject to repeal or alteration by the legislature.

This will have a tendency to place zoning on a more substantial legal basis in the State of New Jersey than it has been. The bureau has furnished various zoning experts in that State with printed and mimeographed material on the subject.

#### KEEPING STEP WITH STYLE THROUGH SIMPLIFICATION

Current demands for better quality, more style and color, also for more variety in products, are natural consequences of greater individual prosperity. They are among the first evidences of the arrival of a higher standard of living, and as such are not to be deprecated.

It is recognized that demands for greater variety often add to manufacturers' problems by increasing unit production costs, expanding inventories, and by requiring greater sales effort to secure satisfactory turnover from the more diversified line. Merchants similarly encounter problems of increased inventory and reduced turnover when stocks become too highly diversified.

The problem, therefore, is to "keep in step with style," and yet retain the advantages inherent in manufacturing

and selling a simplified line. This can be done by regularly reviewing the outward movement of the goods, group by group, class by class, or line by line; in other words, continually studying their relative rates of consumption. Studies in various industries show that as a rule 80 per cent of the business comes from 20 per cent of the varieties offered, and that the other 80 per cent of the line which brings in only one-fifth of the business often absorbs the profits on that 20 per cent of the line composed of the proven "best-sellers."

Frequent analyses of stocks or lines to determine what items have passed out of the "best-seller" class will enable both manufacturer and merchant to keep stocks trimmed to the minimum of variety consistent with service and satisfaction to their trade and to themselves.

Simplification is primarily a commercial program or policy. It means concentration of production and selling effort on varieties in most common or general demand. It is easily seen that in some classes of goods the simplified line of 1928 or of 1929 may be radically different from that of 1927. Simplification means the elimination of the slow moving, the seldom wanted, the little called for. It is a process of reducing numbers, of discontinuing unnecessary or superfluous varieties.

A manufacturer or a merchant who applies simplification has a better chance of keeping step with style, or of meeting the public's demand for more art in industry, than one who does not, for the former has less to throw overboard or liquidate when styles change or living standards advance.

Those who have applied simplification point out its profit-making values, and especially its contribution to greater and sustained purchasing power through the savings it produces. These savings result from the elimination of those wastes found in unwarranted diversification, such as excessive inventories, idle investment, greater cost to carry, slower turnover, rapid obsolescence, and unnecessarily decreased profits.

#### SIMPLIFICATION PROGRAM OF NATIONAL ASSOCIATION OF PURCHASING AGENTS

The National Association of Purchasing Agents has developed a five-year campaign of work of the organization to help business. This program is divided into several groups, each group in charge of a national committee. These groups are as follows:

National Committee on Simplified Invoices, to work for the general adoption of the simplified invoice form by business, thus effecting annual savings of millions; National Committee on Waste Elimination, which will work to eliminate waste in production, distribution, and purchasing, and help producers and distributors of every commodity in their efforts to reduce costs; National Committee on Inquiries and Orders to develop and promote standardized purchase, inquiries, and orders and to give to vendors the same economies which they give up through the simplified invoices; while yet another committee will promote interest in and help establish standardized and simplified practices, grades, etc.

In this work the various committees of the National Association of Purchasing Agents will cooperate with the division of simplified practice, as well as other recognized waste-elimination agencies.

#### CERTIFICATION OF COMMERCIAL STANDARDS

In connection with the development of commercial standards under the auspices of the Bureau of Standards, lists are prepared of manufacturers who have expressed their desire to supply material under contracts based upon certain selected Federal specifications. These manufacturers will certify to the purchaser, upon request, that the material thus supplied complies with the requirements and tests of the specifications and is so guaranteed by them.

By this it is stated that the certification is to be made by the manufacturer and not by the bureau and that the bureau itself will not issue any label. This

is proper, inasmuch as the bureau merely develops the commercial standards in cooperation with the manufacturers, distributors, and organized consumers.

It is interesting to note that many of the specifications to which the certification plan has been or will be applied cover commodities of much concern to housekeepers. While it is not expected that the housekeeper will actually buy commodities on individual specifications, some day she may be induced to confine her purchases of certain kinds of commodities to those known to be manufactured to comply with certain nationally recognized specifications. Perhaps she may even now be induced to examine critically such of these commodities as she does purchase to determine whether or not they are as represented and will comply with her own requirements, to purchase on the basis of real quality and ability to meet service requirements rather than on the basis of superficial appearance or of the numerous kinds of sales arguments.

#### HEIGHT OF AUTOMOBILE BUMPERS

The standard adopted by the Society of Automotive Engineers for bumpers of passenger cars, small motor coaches, and light delivery trucks is as follows: The horizontal center line of bumper face exclusive of fittings shall be 18 inches plus or minus three-eighths inch per inch of effective face, above the ground for front bumpers and 19 inches, plus or minus three-eighths inch per inch of effective face, above the ground for rear bumpers or fender guards. The minimum over-all length of front bumpers shall be 60 inches on passenger cars having the standard 56-inch tread. The minimum dimension measured between the extreme ends of rear bumpers or fender guards shall be 60 inches on passenger cars having the standard 56-inch tread. The minimum vertical depth of bars for single-bar type front and rear bumpers shall be 2 inches. The bumper height shall be measured with the car supplied with the normal amount of water, oil, and gasoline, but without pas-



sengers or other load. The vertical spread of contact face shall be the distance between the upper and lower edges of the outer-bumper elements, exclusive of any additional projecting parts.

The only way to make these standards effective is through adherence on the part of car manufacturers and car owners. It is urged that car owners check up on their bumpers to see if they are attached in accordance with the above standards. Those having bumpers installed after purchasing a car would do well to have them set according to these measurements. In present traffic conditions it is important, where bumpers meet, that they meet face to face and not overlap or interlock as they so often do now.

#### SHORT-LENGTH LUMBER

The campaign of the National Committee on Wood Utilization, Department of Commerce, for the use of short-length lumber, which is less than 8 feet, has been strengthened by the recent action of at least two Federal Government departments. At the request of the Secretary of War, committee experts were called upon to assist the Quartermaster General in drafting new specifications for box and crating lumber. The revised specifications just sent out by the War Department call for lumber in lengths of 4 feet and up, with a considerable percentage of short lengths.

Further revision of the specifications will be effected should this first experiment give satisfactory results. Following that action, the Office of Indian Affairs, Department of the Interior, announced its intention of specifying short lengths and end-matched lumber whenever feasible. Much favorable comment on the use of short-length lumber has already been received from industry, because this policy enables a closer utilization of saw logs, at the same time giving the benefits of savings resulting from the lower prices quoted on short lengths.

#### SIMPLIFICATION OF CONCRETE FORMS

Proposed standard dimensions for removable concrete forms was a subject

discussed at the semiannual meeting of the Concrete Reinforcing Steel Institute held at Detroit. The conference decided to standardize on the width of forms, the length and total contraction of tapers, special filler widths and depths of forms. These recommendations will be taken up with the division of simplified practice, Department of Commerce, with the idea of nationalizing these standard dimensions.

#### PAINT AND VARNISH BRUSHES

The standing committee of the brush industry has revised Simplified Practice Recommendation No. 43, Paint and Varnish Brushes, for another year, beginning December 15, 1927, by adding the following:

TABLE 3.—*Leather-bound wall and stucco brushes*

Size	Number	Size	Number
<i>Inches</i>		<i>Inches</i>	
3	25	4½	40
3½	30	5	45
4	35		

#### AMERICAN MARINE STANDARDS COMMITTEE

Of the 53 standards thus far promulgated by the American Marine Standards Committee, 51 have been or are being published at this time. Numerous additional standards covering a variety of subjects are in course of development by the committee. It is expected that the number of standards promulgated and that the list of publications will be greatly increased during 1928.

For the benefit of those readers of the Technical News Bulletin who may not be familiar with the American Marine Standards Committee, it seems appropriate to state that it was organized primarily to promote simplification of practice and economy in the construction, operation, and maintenance of ships and port facilities. In its plan of organization the underlying authority is vested in a membership enrolled from the marine and allied industries. An executive board, elected annually from and

by the membership, appoints and controls the administrative officers and technical committees, directs the general policies, and defines the technical working program. In actual operation the committee is regarded as a unit of the division of simplified practice. Its secretary, who is in effect the executive officer, has his headquarters in the division.

Up to the present time the field of activities of the committee has been confined to three divisions—hull details, engineering (machinery) details, and ship operation details and supplies. Each of these divisions is headed by a technical committee appointed by the executive board. Each technical committee in turn forms subject committees as required to develop details. The personnel of the subject and technical committees is drawn from the marine field at large and not confined to the membership. Provision is made to coordinate the work with current progress in related activities through contacts established with other standardizing bodies in the United States, and progress of similar work abroad is closely observed by exchange of publications with foreign bodies.

#### STANDARDIZATION OF GRADES USED IN LEATHER INDUSTRY

Improved methods of removing hides and standardization of leather are sought by members of the leather industry, working through the Tanners' Council, and assisted by the hides and leather and simplified practice divisions of the Department of Commerce, and the Department of Agriculture. The latter department is interested in promoting greater attention among cattle raisers to the protection of hides on living animals and more careful removal of the hides from the carcass. The two divisions of the Commerce Department are cooperating with the Tanners' Council in enlisting the interest of the leather industry in the standardization of leather. Simplification could also establish standard specifications of leather so that light medium and heavy medium, or whatever

designations are decided upon, will have a common and general meaning instead of the variety of dimensions they now admit.

#### RECENT SIMPLIFIED PRACTICE ACTIVITIES

A few of the preliminary, general, and revision conferences recently held under the auspices of the division of simplified practice are as follows:

**Die head chasers.**—The standing committee representing this recommendation has revised the recommendation in which Table 2 was completely eliminated, and inserted a paragraph in Table 1 to the effect that "The stockable sizes shown in the following tables are for right-hand threads only." The revision is to become effective April 1, 1928, subject to regular annual revision by a similar meeting. The average degree of adherence to the recommended stockable sizes of die head chasers was 80.74 per cent.

**Steel barrels and drums.**—Three changes in this recommendation have been made by the standing committee of the steel barrels and drums industry. These changes are as follows:

1. Standard I. C. C. drum, 33-gallon eliminated and 30-gallon substituted.
2. Friction cover light drum, a 100-pound grease drum, should be added to this classification.
3. The note under Table 2 should be changed to read as follows: "Capacity of drum to be not less than 10 gallons nor more than 110 gallons, and gauge of steel to be used to be not less than 20 U. S. Standard."

The elimination of the 33-gallon I. C. C. drum is promoted by the fact that the survey of 1926 showed 1,255, while in the case of the 30-gallon drum more than 9,000 were recorded. The addition of the 100-pound grease drum was necessary in view of the fact that the survey indicated approximately 25,000 of these being used during 1926. It is a special drum, devoted chiefly to use by the oil concerns as containers for lubricating grease. The recommendation became effective January 1, 1928.

**Adhesive plaster.**—A meeting was held in New York on December 20 of manufacturers of adhesive plaster to draft a tentative simplified recommendation for the commodity. As a result of this meeting, the tentative recommendation provides for the elimination of two-thirds of the variety of adhesive plaster in rolls and the elimination of several widths in all lengths, as well as the elimination of short lengths in some of the retained widths of adhesive plaster on spools. The proposed schedule will be presented to all interested at a general conference this month.

**Gas cocks.**—The Manufacturers' Standardization Society of the Valves and Fittings Industry is at present engaged in a survey of diversification in sizes and styles of plug cocks for gas service under present conditions. It is expected that this organization will submit a tentative simplified practice recommendation to the division of simplified practice within the next two months.

**Containers for vegetable shortening.**—A variety survey of containers has been completed and the Interstate Cotton Seed Crushers' Association has requested the division to call a general conference of manufacturers, distributors, and users to adopt and promulgate a simplified practice recommendation covering sizes and types of containers used for packing vegetable shortening.

**Hospital plumbing fixtures.**—A preliminary conference of manufacturers will be held this month to review and discuss the consolidated report showing 1926 sales figures on various types of hospital plumbing fixtures. The representatives present at this meeting will determine the appropriate simplified list to be submitted to the hospital authorities for criticism and comment, after which a tentative simplified practice recommendation will be submitted to go through the regular procedure of the division of simplified practice.

#### NEW PUBLICATIONS

Additions to Supplementary List of Publications of the Bureau of Standards (beginning July 1, 1927)

#### Scientific Papers<sup>1</sup>

- S562. Density of hot-rolled and heat-treated carbon steels; H. C. Cross and E. E. Hill. Price, 10 cents.
- S563. Gases in metals. III. The determination of nitrogen in metals by fusion in vacuum; Louis Jordan and James R. Eckman. Price, 10 cents.
- S565. Thermal expansion of beryllium and aluminum-beryllium alloys; Peter Hidnert and W. T. Sweeney. Price, 10 cents.

#### Technologic Papers<sup>1</sup>

- T355. Electrolysis testing; B. McCollum and K. H. Logan. Price, 30 cents.
- T356. Controlling the consistency of enamel slips; W. N. Harrison. Price, 15 cents.
- T357. Calibration and adjustment of the Schopper folding tester; F. T. Carson and L. W. Snyder. Price, 10 cents.
- T358. Air-hardening rivet steels; H. K. Herschman. Price, 15 cents.
- T360. Cleaning of fur and leather garments; M. H. Goldman and C. C. Hubbard. Price, 10 cents.

#### Circulars<sup>1</sup>

- C38 (5th ed.). The testing of rubber goods. Price, 30 cents.
- C140 (2d ed.). United States Master Specification for screws, wood. Price, 5 cents.
- C337. Manufacture of lime. Price, 45 cents.
- C358. United States Government Master Specification for hose, fire, unlined linen. Price, 5 cents.

#### Miscellaneous Publications<sup>1</sup>

- M82 (Supersedes M78). Standard atmosphere chart. Price, 5 cents.

<sup>1</sup> Send orders for publications under this heading, with remittance, only to Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 25 cents per year (United States, Canada, and Mexico); 40 cents (foreign).

Simplified Practice Recommendations<sup>1</sup>  
(Elimination of Waste)

R19 (1st rev.). Asbestos paper and asbestos paper millboard. Price, 5 cents.

R27 (1st rev.). Cotton duck. Price, 5 cents.

R61. White glazed tile and unglazed ceramic mosaic. Price, 5 cents.

Technical News Bulletin<sup>1</sup>

TNB129. Technical News Bulletin, January, 1928.

OUTSIDE PUBLICATIONS<sup>2</sup>

Absorption spectrum of mercury at high pressure admixed with nitrogen. Howard R. Moore; Science (New York, N. Y.), Vol. LXVI, No. 1718, p. 543; December 2, 1927.

The inorganic and analytical chemistry of silver, gold, and the platinum metals. E. Wichers; Annual Survey of American Chemistry, Vol. II. Edited by National Research Council and published by Chemical Catalogue Company (New York, N. Y.); December, 1927.

Creusets refractaires pour fusion des métaux pur (nickel, fer, platine). L. Jordan, A. A. Peterson, and L. H. Phelps; La Revue de Fonderie Moderne (Paris, France), Vol. 21, p. 465; November 25, 1927.

Recent experiments relating to the wear of plug gauges. H. J. French and H. K. Herschman; Transactions, American Society for Steel Treating (Cleveland Ohio), Vol. 12, p. 921; 1927.

<sup>1</sup> Send orders for publications under this heading, with remittance, only to Superintendent of Documents, Government Printing Office, Washington, D. C. Subscription to Technical News Bulletin, 25 cents per year (United States, Canada, and Mexico); 40 cents (foreign).

<sup>2</sup> "Outside publications" are not for distribution or sale by the Government. Requests should be sent direct to publishers.

Combustion time in the engine cylinder and its effect on engine performance.

C. F. Marvin, jr.; National Advisory Committee for Aeronautics (Washington, D. C.), Technical Report No. 276; November, 1927.

Protection of farm property against lightning. M. G. Lloyd; Proceedings, National Association of Mutual Insurance Companies (Indianapolis, Ind.), p. 93; 1927.

Fire resistance in dwelling construction. S. H. Ingberg; Proceedings, National Association of Mutual Insurance Companies (Indianapolis, Ind.), p. 99; 1927.

Progress report on investigation of sagger clays, their elasticity, transverse strength, and plastic flow at 1,000° C. R. A. Heindl; Journal American Ceramic Society (Columbus, Ohio), Vol. 10, No. 12, p. 995; December, 1927.

Vitreous enamel slips and their control. W. N. Harrison; Journal American Ceramic Society (Columbus, Ohio), Vol. 10, No. 12, p. 970; December, 1927.

Studies on the hydrolysis of compounds which may occur in Portland cement. William Lerch and R. H. Bogue; Paper No. 11, Portland Cement Association Fellowship (% Bureau of Standards, Washington, D. C.); November, 1927.

The combination of lime in Portland cement compounds. W. C. Hansen and R. H. Bogue; Portland Cement Association Fellowship (% Bureau of Standards, Washington, D. C.); Paper No. 10; November, 1927.

Adhesion of plaster and stucco to hollow clay building tile. J. A. Murray and H. D. Foster; American Architect (New York, N. Y.), Vol. CXXXII, No. 2535, p. 839; December 20, 1927.

Résumé of year's textile research at the Bureau of Standards. C. W. Schoffstall; Textile World (New York, N. Y.), Vol. LXXII, No. 19, p. 103; November 5, 1927.

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